042390.P5112

Patent Application

#17
4/3/02
DS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Patent Application of:)
David Horne)
)
Serial No.: 09/002,747)
Filed: January 5, 1998)
)
For: A METHOD FOR USING CODEBOOK INDEXING TO ACHIEVE HIGH BIT DENSITIES IN A DIREST-SEQUENCE CDMA SPECTRUM COMMUNICATION SYSTEM)

Date: August 16, 2001

Art Unit: 2631

Examiner: T. Ghebretinsae

HONORABLE DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE,
Washington, D.C. 20231

APPEAL BRIEF

IN SUPPORT OF APPELLANT'S APPEAL

TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Sir:

Applicant (hereafter "Appellant") hereby submit this Brief in triplicate in support of their Appeal from a final decision by the Examiner in the above-captioned case. Appellant respectfully requests consideration of this Appeal by the Board of Patent Appeals and Interferences for allowance of the claims in the above-captioned patent application.

An oral hearing is not desired.

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO:
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE, WASHINGTON, D.C. 20231, ON: August 16, 2001
Date of Deposit

INTEL CORPORATION
Name of Assignee

SIGNATURE 8/16/01
DATE

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

The invention is assigned to Intel Corporation of 2200 Mission College Boulevard, Santa Clara, California 95052.

II. RELATED APPEALS AND INTERFERENCES

To the best of Appellant's knowledge, there are no appeals or interferences related to the present appeal that will directly affect, be directly affected by, or have a bearing on the Board's decision.

III. STATUS OF THE CLAIMS

Claims 1-11 are currently pending in the above-referenced patent application. Claims 1, 3, 5, 6, 8, 10, and 11 were rejected in the Final Office Action, mailed on January 18, 2001, and are the subject of this appeal. Claims 2, 4, 7, and 9 were objected to as being dependent upon a rejected claim. The Examiner confirmed his final rejection in an Advisory Action mailed on April 11, 2001.

Claims 1, 3, 5, 6, 8, 10, and 11 stand rejected under 35 U.S.C. § 103(a) on U.S. patent 5,173,923 by Crepso et al.

Claims 1, 3, 8, 10, and 11 stand rejected under 35 U.S.C. § 102(e) on U.S. patent 5,432,814 by Hasegawa.

IV. STATUS OF AMENDMENTS

To the best of Appellant's knowledge, no amendments have been filed subsequent to the Final Rejection.

A copy of all claims on appeal, namely claims 1, 3, 5, 6, 8, 10, and 11, and objected to claims 2, 4, 7, and 9 is attached hereto as Appendix A.

V. SUMMARY OF THE INVENTION

Simply stated, some embodiments of Appellant's invention provide a table of orthogonal pseudo-noise codes. The table may be partitioned into multiple codebooks such that the codebooks may be assigned to a user. The pseudo-noise codes contained within the codebooks are used to spread an information signal. By using codebook indexing, multiple bits of information may be transmitted per pseudo-code instead of a single bit. (Summary of the Invention)

An example is now provided with reference to the embodiment shown in Appellant's FIG. 2b and 3, although the scope of the present invention is not limited in this respect. As shown in FIG. 2b, an information signal 210 may be transmitted (e.g. the number 'five' represented in binary form '101'). In this embodiment codebook indexing may be used. In codebook indexing, the position of the pseudo-noise code within the codebook is used to encode multiple bits of information within the pseudo-noise code sent. For example, if two bits of information are to be sent per pseudo-noise code, a codebook with four entries may be used (e.g. the four entries corresponding to the four states of a two-bit, binary value, namely '00,' '01,' '10,' and '11') (page 5, lines 15-22 of specification)

So in the example shown in FIG. 2b, if the number five is represented by '101' then the 5th pseudo-noise code in the codebook is the transmitted signal. For example, if the 5th entry in the codebook is code '01011010' then '01011010' is transmitted since is corresponds to an information value of five. (page 6, lines1-7)

Appellant's FIG. 3 illustrates a table 300 having three codebooks (e.g. codebooks 311, 312, and 313). The codebooks may correspond to three users. Codebooks 311 and 312 both have four entries so each pseudo-noise code in the codebook may represent a two bit, binary value. In the case of codebook 311, code A may be used to indicate a binary value of '00', code B may be used to indicate a binary value of '01' and so on. The same may be true of codebook 312. Thus, each pseudo-noise code in codebooks 312 and 312 may transmit more than one bit of information. (page 6, lines 8-17)

Codebook 313 has eight values so that each entry in the codebook may communication an information signal having three bits of binary data. For example, code

I may be used to represent an '000', code J may be used to represent a '001', and code P may be used to represent at '111'. (page 6, lines 17-25)

Because each user may have a codebook having more than one pseudo-noise code, each pseudo-noise code may represent more than one bit of information, and thus, the transmission rate may be improved.

VI. ISSUES PRESENTED

A. The Examiner inappropriately made the rejection final.

B. Claims 1, 3, 5, 6, 8, 10, and 11 are patentable under 35 U.S.C. § 103(a) on U.S. patent 5,173,923 by Crepso et al.

C. Claims 1, 3, 8, 10, and 11 are patentable under 35 U.S.C. § 102(e) on U.S. patent 5,432,814 by Hasegawa.

VII. GROUPING OF CLAIMS

For the purposes of this appeal:

Claims 1, 3, 5, 6, 8, 10, and 11 stand or fall together as Group I.

VIII. ARGUMENT

A. THE EXAMINER INAPPRORIATELY MADE THE SECOND OFFICE ACTION FINAL, AND THUS, DENIED APPELLANT FULL OPPORTUNITY TO RESPOND TO THE ISSUES RAISED BY THE EXAMINER.

In the first Office Action, mailed February 23, 2000, the Examiner rejected claims 1, 3, 5-6, 8, and 10-11 only under 35 USC § 103(a) over Crepso et al. in view of Gundmundson.

Appellant responded on May 10, 2000, by traversing the rejection. The Examiner obviously agreed with Appellant, as the Examiner has since withdrawn that rejection. Appellant also amended the claims. The amendment simply removed from the preamble of the claims the phrase "for achieving high bit densities in a direct-sequence CDMA spread spectrum communication system: and the phrase "the steps comprising."

The Examiner responded in the second Office Action, mailed January 18, 2001, by raising new grounds for rejection. Namely, the Examiner rejected claims under 35 USC § 102(e) in view of Gundmundson and 35 USC § 102(e) in view of Hasegawa. The Examiner also made this rejection final stating that Appellant's amendments necessitated the new grounds for rejection.

Appellant's response to the Final Office Action objected to the finality of the second Office Action and Appellant repeats that objection now. Appellant's amendment simply removed language from the preamble to make clear that the claims were not invoking interpretation under 35 USC §112. Appellant's amendment was not needed to overcome the Examiner's rejection. In fact, if anything, Appellant's amendments made the claims broader, not narrower. Appellant would also like to point out that no where in the first or second Office Action did the Examiner rely on the language in Appellant's preamble to reject the claims. Thus, the amendment could not have ever been part of the basis for the original rejection. This is further demonstrated as the Examiner has already conceded that the rejection made in the first Office Action was inappropriate and has withdrawn that rejection.

The record plainly indicates that the Examiner raise new grounds of rejection in the second Office Action. The Examiner raised these new rejections upon realizing that the original rejection was inappropriate. More importantly, Appellant's amendment did not necessitate the new grounds for rejection. Accordingly, the Examiner inappropriately made the second Office Action final, and thus, denied Appellant full opportunity to address the new grounds of rejection raised by the Examiner.

Appellant would also like to kindly point out that the second Office Action rejected claims 1, 3, 5-6, 8, and 10-11 under 35 USC § 103(a) in view of Crepso et al. and Gudmundson (see Final Office action page 2, paragraph 3, line 2). Appellant traversed this rejection citing how the teachings of Gudmundson would destroy the intent behind the teaching of Crepso et al, and thus, one skilled in the art would not be motivated to make the combination suggested by the Examiner.

However, in the Advisory Action, mailed April 11, 2001, the Examiner once again raised a new grounds of rejection by changing the basis of the rejection under 35 USC § 103(a). The Examiner stated that the rejection in the Final Office Action was a typographical error to have included Gudmondson in the rejection. Again, the Examiner has changed the basis of his rejection under 35 USC §103(a) and denied Appellant the full opportunity to respond accorded under the law. Once the Advisory Action was mailed, the only recourse available to Appellant was to challenge the basis and inappropriateness of the finality of these rejections is through the Appeal Process.

B. REJECTION OF CLAIMS 1, 3, 5, 6, 8 AND 10-11 (GROUP I) UNDER 35 U.S.C. § 103(A) ON CREPSO ET AL. IS IMPROPER. CREPSO ET AL. DOES NOT EXPRESSLY OR INHERENTLY MEET CLAIM LIMITATIONS DIRECTED TO CODEBOOKS.

The Examiner has rejected claims 1, 3, 5, 6, 8 and 10-11 under 35 U.S.C. §103(a) as being obvious in view of Crepso et al. As noted above, this was a new grounds of rejection raised for the first time in the Advisory Action mailed April 11, 2001.

It is well established that obviousness requires a teaching or a suggestion by the relied upon prior art of all the elements of a claim (M.P.E.P. §2142). Appellant respectfully submits that Crepso et al. does not meet the requirements of an obvious rejection in that Crepso et al. does not contain any teaching or suggestion of codebooks.

Claim Group I

Claim 1 states:

A method comprising:

storing a table of orthogonal pseudo-noise codes;

partitioning the table of orthogonal pseudo-noise codes into at least one codebook having a plurality of pseudo-noise codes;

assigning a first codebook to a first user;

spreading a first information signal for the first user with a first pseudo-noise code contained within the first codebook.

Crepso et al. does not contain any teaching or suggestion of codebooks. Even the Examiner admitted that Crepso et al. does not teach or suggest that multiple pseudo-noise codes are assigned to each transmitter (see Final Office Action, page 2, paragraph 3, lines 5-6).

Crepso et al. specifically teaches "assigning **a unique code** to each transmitter, and then by utilizing **the unique code** to encode the frequency domain characteristic of a transmitter pulse" (see column 2, lines 4-7, emphasis added). Crepso et al. also discloses

at column 4, lines 46-55, the formula that is used to define the code assigned to each source and how that code can be a complex valued PN sequence. Crepso et al. then discloses at column 6, line 9, through column 7, line 33, the mathematics that are used "to prepare the received characteristic for detection within detector 440." This includes multiplying the received characteristic by "frequency characteristic S(f); the conjugate of the pseudo-noise source $PN_i(f)$, i.e., $PN_i^*(f)$; and the conjugate to the channel characteristic H(f)" (see column 6, lines 12-16).

Crepso et al. specifically states that **a single, unique** pseudo-noise code is assigned to each transmitter. Furthermore, all of the figures, formulas, and text of Crepso et al. are limited to a system where the transmitter has **a unique code** that is used to decode the receive signal. Appellant respectfully submits that the system and mathematics provided by Crepso et al. are tailored and optimized for system that "generates a transmitter pulse which is power limited and which must match to a channel having bandwidth restrictions, additive noise, and frequency transfer response characterized by loss and distortion" (see column 1, lines 61-66).

More importantly, Crepso et al. does contain any teaching or suggestion of assigning each transmitter a set of PN sequences as suggested by the Examiner. Moreover, Crepso et al. does not contain any explanation as to how the modification proposed by the Examiner would or even could be accomplished.

Since Crepso et al. does not and cannot teach or suggest the use of codebooks, it is impossible for Crepso to contain any teaching or suggestion of:

a) how to store a table of orthogonal pseudo-noise codes;

b) how to partition the pseudo-noise codes into a codebook having a plurality of pseudo-noise codes;

c) how to assign a codebook to a user; or even

d) how to spread an information signal with a pseudo-noise code contained within a codebook.

Accordingly, Crepso et al. cannot make Appellant's claim 1 obvious. Since claims 3, 5, 6, 8, and 10-11 depend from claim 1, they cannot be obvious for at least the same reason and the Examiner's rejection of claims 1, 3, 5, 6, 8, 10-11 under 35 U.S.C. § 103(a) is improper.

C. REJECTION OF CLAIMS 1, 3, 8, AND 10-11 (GROUP I) UNDER 35 U.S.C. § 102(e) ON HASEGAWA IS IMPROPER. THE EXAMINER HAS FAILED TO ESTABLISH A PRIMA FACIE SHOWING OF ANTICIPATION BECAUSE THE EXAMINER PROVIDED NO EXPLANATION OF HOW HASEGAWA TEACHES OR SUGGESTS THE USE OF CODEBOOKS.

The Examiner has rejected claims 1, 3, 8, and 10-11 under 35 U.S.C. §102(e) as being anticipated by Hasegawa. As is well-established, in order to successfully assert a *prima facie* case of anticipation, the Examiner must provide a single prior art document that includes every element and limitation of the claim or claims being rejected. Therefore, if even one element or limitation is missing from the cited document, the Examiner has not succeeded in making a prima facie case.

Claim Group I

Claim 1 states:

A method comprising:

storing a table of orthogonal pseudo-noise codes;

partitioning the table of orthogonal pseudo-noise codes into at least one codebook having a plurality of pseudo-noise codes;

assigning a first codebook to a first user;

spreading a first information signal for the first user with a first pseudo-noise code contained within the first codebook.

EXAMINER HAS FAILED TO MAKE PREREQUISITE PRIMA FACIE SHOWING.

To begin, the burden does not shift to Appellant to respond to a rejection until the Examiner has established a prima facie showing of how every element, feature, and limitation of a claim is anticipated by the relied upon document. With respect to Hasegawa, Appellant would like to kindly point out that no where in the Final Office Action did the Examiner provide any explanation as to how Hasegawa teaches or suggests the use of multiple codebooks. In fact, the sole paragraph in the Final Office

Action that discussed Hasegawa did not even mention the work "codebook" or "codebooks." Thus, at a minimum, the Examiner has failed to establish a prima facie showing of how Hasegawa anticipates every limitation in claim 1.

Hasegawa does not teach or suggest every limitation of the claims

Although the burden to respond has not shifted to Appellant because a prima facie showing has not been made, Appellant would like to provide at least one reason why Hasegawa cannot anticipate Appellant's claim 1. As one reason, Hasegawa does not anticipate claim 1 is because Hasegawa does not teach or suggest a table of orthogonal pseudo-noise codes divided into codebooks, where a codebook is assigned to a user.

In the Final Office Action, the Examiner's based his rejection on what is shown in FIGs 1 and 2. Appellant would like to point out that this was the only portion of Hasegawa that the Examiner referred to. (see Final Office Action, page 3, paragraph 6, line 8).

PN1-PNK shown in figs. 1-2 of Hasegawa are not codebooks

In referring to figs. 1 and 2, the Examiner made reference to PN codes sequences (PN1-PNK). However, these are not codebooks. As explained at column 3, lines 37-64, PN1-PNK are the hoping codes used to coordinate the hopping pattern and determine what frequencies are to be used to transmit. Hasegawa even states the spreading codes are switched in accordance with the predetermined hopping pattern (see column 5, lines 15-20). Accordingly, PN1-PNK are hopping codes used to control what frequency is used. More importantly, PN1-PNK are not determine based on the content or value of the information being sent. In addition, Hasegawa does not teach or suggest creating a table of pseudo-noise codes, dividing the table into codebooks, or assigning one of the codebooks to a use.

Thus, not only has the Examiner failed to establish a prima facie showing of anticipation, but Hasegawa fails to teach of suggest several of the limitations recited in claim 1. Since claims 3, 8, and 10-11 depend from claim 1, the rejection of these claims is also improper and Hasegawa cannot anticipate these claims for at least the same reason.

IX. CONCLUSION

Appellant respectfully submits that all the pending claims in this patent application are patentable and request that the Board of Patent Appeals and Interferences overrule the Examiner and direct allowance of the rejected claims and objected claims, 2, 4, 7, and 9.

This brief is submitted in triplicate, along with a check for $300.00 to cover the appeal fee for one other than a small entity as specified in 37 C.F.R. § 1.17(c). Please charge any shortages and credit any overcharges to Deposit Account No. 02-2666.

Respectfully submitted,

Date: August 16, 2001 Kenneth M. Seddon

Kenneth M. Seddon
Attorney for Appellants
Registration Number: 43,105

Blakely, Sokoloff, Taylor & Zafman
12400 Wilshire Boulevard
Seventh Floor
Los Angeles, CA 90025-1026
(408) 720-8598

X. APPENDIX A: CLAIMS ON APPEAL

1. A method comprising:

storing a table of orthogonal pseudo-noise codes;

partitioning the table of orthogonal pseudo-noise codes into at least one codebook having a plurality of pseudo-noise codes;

assigning a first codebook to a first user;

spreading a first information signal for the first user with a first pseudo-noise code contained within the first codebook.

2. The method of claim 1 wherein the location of the first pseudo-noise code within the first codebook corresponds to the value of the first information signal for the first user.

3. The method of claim 1 further comprising:

spreading a second information signal for the first user with a second pseudo-noise code contained within the first codebook.

4. The method of claim 3 wherein the location of the second pseudo-noise code within the first codebook corresponds to the value of the second information signal for the first user.

5. The method of claim 1 further comprising:

assigning a second codebook to a second user;

spreading a first information signal for the second user with a first pseudo-noise code contained within the second codebook.

6. The method of claim 5 further comprising:

spreading a second information signal for the second user with a second pseudo-noise code contained within the second codebook.

7. The method of claim 6 wherein the location of the second pseudo-noise code within the second codebook corresponds to the value of the second information signal for the second user.

8. The method of claim 1 further comprising:

despreading the first information signal for the first user with the first pseudo-noise code within the first codebook.

9. The method of claim 8 wherein the location of the first pseudo-noise code within the first codebook corresponds to the value of the first information signal.

10. The method of claim 1 wherein the partitioning the table of the orthogonal pseudo-noise codes further comprises:

partitioning the table into codebooks such that there are 2^n entries, where n is a whole number.